

Procedure: C-A-CPS-007

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COLLIDER-ACCELERATOR DEPARTMENT

Title: Lockout Procedure for the Yellow IR Quadrupole Stand Alone Nested Power Supplies or QPA's During Running Periods When a Power Supply Must be Repaired

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Date: _____

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Date: _____

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Date: _____

Lockout Procedure For the Yellow IR Quadrupole Stand Alone Nested Power Supplies or QPA's During Running Periods When a Power Supply Must be Repaired

1. Purpose

- 1.1 This procedure provides instructions to the Collider Electrical Power Supply Group (CEPSG) technicians and the Collider-Accelerator Support (CAS) technicians on the proper lockout that must be done before you repair a stand alone nested Yellow IR quadrupole power supply (p.s.) or QPA.

Caution:

This lockout procedure can only be used in preparation to repair a Stand alone Nested Yellow IR Quadrupole P.S. or QPA during running periods. See Appendix 1 for a complete list of the sitewide names of these Stand alone Nested Yellow IR Quadrupole P.S's and QPA's. If the sitewide name of the Yellow p.s. or QPA that must be repaired is on the list in Appendix 1 then you can use this procedure.

- 1.2 C-A Policy states that the preferred method to protect workers from energy sources is Lockout-Tagout (LOTO). There is no need to place a tag on the lock if the lock will not stay on past 1 shift or overnight as is consistent with standard LOTO Procedures.
- 1.3 Running Periods are defined as those periods when the C-A Main Control Room (MCR) has a scheduled operator on watch 24 hours a day and beam is being delivered or beam is being prepared to be delivered to RHIC.

2. Responsibilities

2.1 Responsibilities of the CEPSG and CAS Technicians

- 2.1.1 Any CEPSG and CAS Technicians preparing to repair a Stand alone Nested Yellow IR Quadrupole P.S. or QPA shall apply their lock, as described in section 5, to assure their own safety.

2.2 Responsibilities of System Specialists

- 2.2.1 System Specialists are responsible for training the CEPSG and CAS Technicians.

3. **Prerequisites for the CEPSG and CAS Technicians**

- 3.1 The CEPSG and CAS Technicians must be trained in LOTO.
- 3.2 The CEPSG and CAS Technicians must be trained in the use of this procedure and their name must appear on a list maintained by Don Bruno and Bill Anderson. This list is attached in Appendix 3 and will be updated as more people are trained. The training is valid for 1 year.
- 3.3 The CEPSG and CAS Technicians must be trained in Electrical Safety.
- 3.4 The CEPSG and CAS Technicians must wear safety glasses when using this procedure.

4. **Precautions for the CEPSG and CAS Technicians**

- 4.1 If the repair of the Nested Yellow IR Stand alone Quadrupole p.s. is in the DC compartment or if you must work on the isolation amplifier board then this procedure must be used. If the repair is in the upper front AC compartment then you can just lockout the 480VAC to the p.s. If the repair is in the lower front control compartment then you can just lockout the 480VAC to the p.s. if you stay at least 6 inches away from the isolation amplifier board. See Figure 1 in Appendix 2 for a photo of the location of the isolation amplifier board.

5. **Procedure**

- 5.1 If you must repair a Stand alone Nested Yellow IR Quadrupole P.S. or QPA then write down the name of this p.s. here: _____
- 5.2 Next consult the Appendix 1 and make sure the name is in the appendix. You have now confirmed that this p.s. or QPA is a Stand alone Nested Yellow IR Quadrupole P.S. or QPA

Warning:

If this p.s. does not appear in Appendix 1 then STOP and consult the engineer.

- 5.3 Make sure the Yellow link is down before performing this lockout. MCR can tell you if the link is down. If MCR says the link is not down then tell them you will bring the link down.
- 5.4 Get a lock and go out and look at the p.s. or QPA that must be repaired. See Appendix 1 to find out which building the p.s. or QPA is in. At the top of the p.s. is a “rack” name even though the p.s. is not in a rack. Write down the building and rack name here:
Building _____
Rack Name _____

- 5.5 If the Yellow link is not down then tell MCR you will be bringing the link down but they must run all of the p.s.'s to zero current first.
- 5.6 Once the p.s.'s are at zero current you should put the p.s. that must be repaired into LOCAL and STANDBY from the front panel controls. Now put it in the OFF state. Use the OFF pushbutton on the front of the p.s. to do this. The Yellow link will now come down if it is not down already. If a QPA is being repaired do the same thing to its associated p.s.
- 5.7 Now that the p.s. is in the OFF state you can turn OFF the circuit breaker on the front of this p.s.
- 5.8 Lockout the 480VAC disconnect that feeds this p.s. Check off that it has been locked out here:
_____ (Locked out 480VAC Disconnect)
- 5.9 Go to service building 1004B and lockout the following Yellow main quadrupole power supplies:
PYQR_____ (CHECK AFTER LOCKED OUT)
PYQFT_____ (CHECK AFTER LOCKED OUT)
- 5.10 You lock these main p.s.'s out by turning the red front panel switch to the left and then squeeze in the Yellow part of the handle on the switch in. You can now CAREFULLY PUT A LOCK THROUGH THIS HOLE. See Appendix 2 Figure 2 for a photo of the switch.
- 5.11 After you have completed repairing the p.s. or QPA you can now unlock the 480VAC disconnect for the p.s. you were working on and turn ON the circuit breaker on the stand alone p.s.
- 5.12 Next, you can now unlock the main p.s.'s and then restore the regulator to operational conditions. Restore the main p.s. regulator by following this procedure:
<http://www.c-ad.bnl.gov/ceps/files/pdf/Unlock%20and%20Restore%20MPS.pdf>
- 5.13 If there is a problem getting the above link to work in 5.12 then the procedure in 5.12 is called "Unlocking and Restoring Main Power Supplies". It can be found by going to this web page:
<http://www.c-ad.bnl.gov/ceps/Mains.htm>
- 5.14 Once you are done restoring the regulator for the main p.s.'s, tell MCR that they can now bring up the Yellow link up.

Appendix 1
NESTED RHIC IR YELLOW Stand Alone Quadrupole Power Supplies

BUILDING 1002B	
P.S. Name	Rack Number
Y2-Q7-PS	R2BYQF5
BUILDING 1004B	
P.S. Name	Rack Number
YO4-QD7-PS	R4BYQF6
YI3-QF7-PS	R4BYQF5
Y-QTRIM-PS	R4BOFF2
BUILDING 1006B	
P.S. Name	Rack Number
Y6-Q7-PS	R6BYQF5
BUILDING 1008B	
P.S. Name	Rack Number
Y8-Q7-PS	R8BYQF5
BUILDING 1010A	
P.S. Name	Rack Number
YO9-QD7-PS	R10AYQF5
YI10-QF7-PS	R10AYQF6
BUILDING 1012A	
P.S. Name	Rack Number
Y12-Q7-PS	R12AYQF5

Appendix 1 (continued)
NESTED RHIC IR Stand Alone Quadrupole QPA's

BUILDING 1002B	
QPA Name	Rack Number
Y2-Q7-QP	R2BYQF5
BUILDING 1004B	
QPA Name	Rack Number
YO4-QD7- QP	R4BYQF6
YI3-QF7- QP	R4BYQF5
Y-QTRIM- QP	R4BOFF2
BUILDING 1006B	
QPA Name	Rack Number
Y6-Q7- QP	R6BYQF5
BUILDING 1008B	
QPA Name	Rack Number
Y8-Q7- QP	R8BYQF5
BUILDING 1010A	
QPA Name	Rack Number
YO9-QD7- QP	R10AYQF5
YI10-QF7- QP	R10AYQF6
BUILDING 1012A	
QPA Name	Rack Number
Y12-Q7- QP	R12AYQF5

Appendix 2

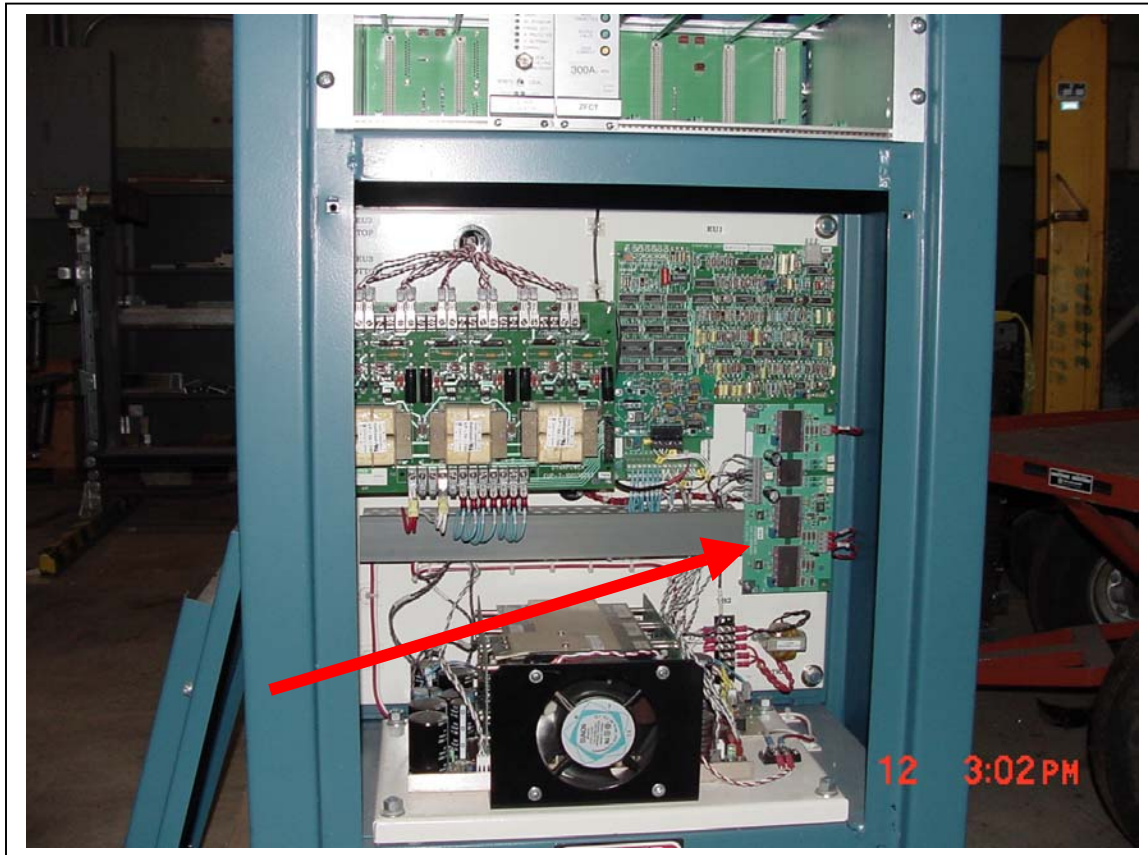
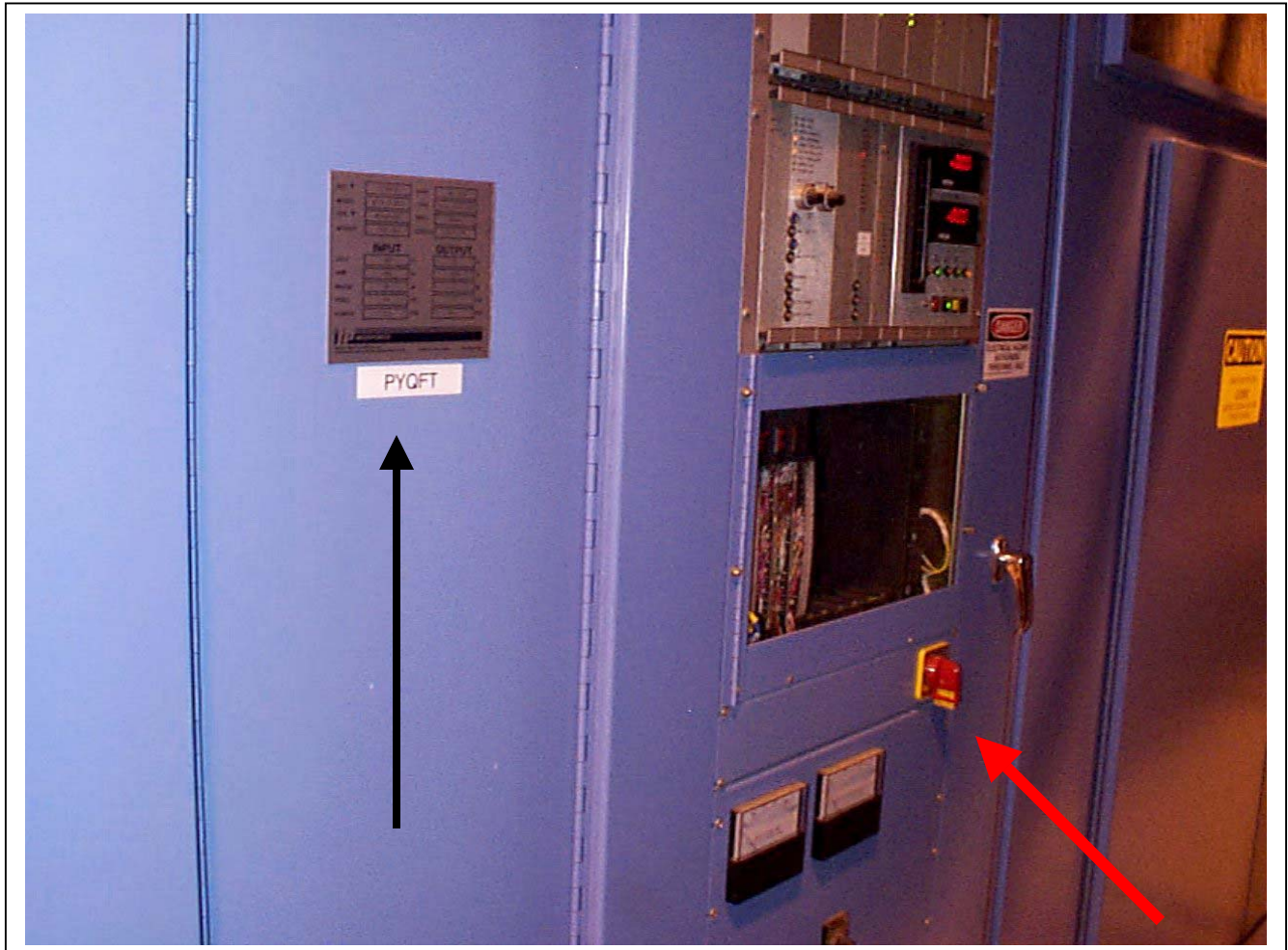


Figure 1: Photo of Isolation Amplifier board in lower front Control Compartment of Stand Alone p.s.

The RED arrow is pointing at the isolation amplifier board.

Appendix 2 (continued)
Photo of one RED Front Panel Switch for the PYQFT Main p.s.



The Red Arrow is pointing to the RED switch you must lockout for the main p.s. PYQFT

The Black Arrow is pointing to the label that tells you which p.s. this is.

Appendix 3

Lockout Procedure For the Yellow IR Quadrupole Stand alone Nested Power Supplies During Running Periods When a Power Supply Must be Repaired

List of People Trained. Training is valid for 1 year

[illegible]